controls (12.8 ± 5.3% vs. 12.6 ± 6.7%; NS). Univariate analysis within the PHPT group revealed a significant inverse correlation between NMD and the calcium-phosphate product ($p = 0.037$, $r = -0.49$). *Conclusion:* Endothelium-independent vasodilation is impaired in patients with PHPT compared to normocalcemic controls without CAD, while endothelium-dependent dilation was similar in both study groups. Thus, altered arterial reactivity in the course of PHPT may predominantly involve the media and not the endothelium as observed previously in patients with various stages of atherosclerosis.

1053 Vascular Characteristics and Adaptation in Hypertension

Wednesday, March 19, 1997, 9:00 a.m.–11:00 a.m.
Anaheim Convention Center, Hall E
Presentation Hour: 10:00 a.m.–11:00 a.m.

1053-13 Renal Artery Stent Placement: Clinical Utility in the Treatment of Renal Artery Stenosis

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The purpose of this study was to assess the safety and efficacy of renal artery stent placement for renal artery stenoses. Balloon expandable stents were placed in 100 consecutive patients (P) (133 renal arteries) with hypertension and renal artery stenosis. Indications for stent placement included aorto-ostial lesion location in 80.5% (n = 107), a suboptimal balloon angioplasty (PTA) result in 12% (n = 16), or restenosis lesions in 7.5% (n = 10). Bilateral stents were placed in 33 P and unilateral stents in 67 P, of whom 5 had a solitary kidney treated. Angiographic success was obtained in 99% (132/133) of the lesions. Clinical success was achieved in 76% of the P. Six months following stent placement, the systolic blood pressure was reduced from 173 ± 25 mmHg to 147 ± 23 mmHg ($p < 0.001$); the diastolic pressure from 88 ± 17 mmHg to 76 ± 12 mmHg ($p < 0.001$), and the mean number of antihypertensive medications per P from 2.6 ± 1 to 2.0 ± 0.9 ($p < 0.001$). In 44 P with chronic renal insufficiency, the pre-procedure creatinine (Cr) was 2.4 ± 1.6 mg/dL and the post procedure Cr was not significantly changed at 2.5 ± 1.8 mg/dL ($p = 0.59$). Angiographic follow-up at 8.7 ± 5.0 months in 67 P revealed restenosis (> 50% diameter narrowing) in 18.8% (15/80) of the stented vessels. *Conclusion:* Renal artery stenting is an effective treatment for renovascular hypertension with a low angiographic restenosis rate. Stent placement is a very attractive alternative to surgical revascularization for renovascular hypertension in P with unattractive lesions for PTA such as ostial lesions, restenotic lesions, and following a suboptimal PTA procedure.

1053-14 Arterial Stiffness Accompanies Non-Dipper Hypertensives

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Many studies have shown that left ventricular hypertrophy and increased arterial stiffness are more common in hypertensive patients with impaired blood pressure variability (non-dippers). Complior, is a validated automatic machine for measuring carotid-femoral pulse wave velocity (PWV), as the ratio of the distance between carotid and femoral artery over the time delay of the pulsewave upstroke (PW) respectively. To assess the relation of impaired aortic distensibility as indicated by increased PWV to hypertension severity, 57 patients with essential hypertension were studied. They were without medications and those with coronary artery disease, diabetes mellitus, and claudication were excluded. They all underwent 24-hour ambulatory blood pressure monitoring with simultaneous recordings of PWV. Twenty patients were classified as dippers and 37 as non-dippers. Nocturnal systolic blood pressure (SBP) and diastolic blood pressure (DBP) were higher in non dippers (131 vs 119 $p = 0.0009$) and 75 vs 68 mmHg ($p = 0.03$). PWV was higher (14.4 vs 11.3 m/sec $p < 0.0001$) while it was related to 24-hour SBP ($r = 0.41$, $p = 0.003$) daytime SBP ($r = 0.33$, $p = 0.01$) and especially nighttime SBP ($r = 0.64$ $p < 0.0001$). Similar correlations were observed between PWV and DBP in 24 hour ($r = 0.57$, $p < 0.0001$) daytime ($r = 0.50$, $p = 0.0001$) and night-time ($r = 0.76$, $p < 0.0001$).

It is concluded that non-dipper hypertensives have impaired arterial compliance and increased PWV. BP is positively related to PWV, especially at night.

1053-15 Relationship Between 24-hr Ambulatory Blood Pressure and Large Arteries Compliance

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Increased blood pressure level induces target organ damage not only at the left ventricle (LV) but also at the large arteries leading to decreased arterial compliance. Ambulatory blood pressure (ABP) is better correlated than office BP with LV mass, but its relationship to arterial compliance has not been documented. Arterial compliance can be assessed either globally for major parts of the arterial tree or locally for segments of large arteries. We enrolled 33 subjects (17 males, 16 females, age 49 ± 16 years) covering a large BP range from 60 to 134 mmHg diastolic and from 110 to 250 mmHg systolic and simultaneously measured proximal arterial compliance C1 of the aorta and major side branches and C2 of the distal part of the arterial circulation (radial artery pulse wave contour analysis) as well as the cross-sectional compliance CC of the common carotid artery (echo wall tracking). Mean 24 hr systolic (S) and diastolic (D) BP were 139 ± 14 mmHg and 83 ± 9 mmHg. Mean proximal and distal compliance respectively were 1.55 ± 0.48 and 0.052 ± 0.02 ml/mmHg, while mean common carotid artery (CC) was 7.7 ± 2.6 10^{-7} m^2/kPa.

Systolic and diastolic ABP are significantly correlated with C1, while systolic ABP is only borderline correlated with CC and C2.

	C1	C2	CC
24 hr SBPr = −0.53, p = 0.002	r = −0.33, p = 0.07	r = −0.32, p = 0.08	
24 hr DBPr = −0.51, p = 0.003	NS	NS	

In conclusion, arterial compliance of the aorta and major side branches correlates inversely with mean ambulatory blood pressure.

1053-16 Influence of blood pressure on progression of cerebral infarction

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Purpose and Methods: To examine whether the treatment for hypertensive patients does prevent the progression of silent cerebral infarction, we obtained the magnetic resonance imaging (MRI) repeatedly at mean interval of 28 months in 107 Japanese subjects aged 35 to 89 (mean 72 years), including 24 nonvalvular atrial fibrillation patients (Af), 24 sinus bradycardia (Brady) and 39 hypertensive patients (HT). Since the patients were receiving various agents, blood pressure of each patient was monitored periodically during the observation period. Depending on the average blood pressure at the end of follow-up period, patients were classified into 3 groups: normotension (NT), borderline (BHT) and hypertension (HT). None had prior history of symptomatic cerebral infarction and neurological abnormalities. Number of infarcted lesions were determined on brain MRI by two independent observers.

Results: SCI lesions were observed in 47 subjects (44%) on enrollment. The increased number of infarcted lesions were found in 18 subjects in NT (n = 51, 35%), 18 in BHT (n = 41, 46%) and 10 in HT (n = 15, 67%). In the patients with Af, infarcted lesions were increased independently from BP (NT = 42%, BHT = 44%, HT = 33%). In the patients with sinus bradycardia, a vigorous control of BP seems to be rather harmful (NT = 67%, BHT = 40%, HT = 100%). In contrast, in hypertensive patients, blood pressure controlled to the normal level appears to result in the lower incidence of the progression of infarcted area (NT = 33%, BHT = 59%, HT = 57%).

Conclusion: Our data indicate that an appropriate anti-hypertensive treatment prevents the occurrence of cerebral infarction in hypertensive patients.

1053-17 Arterial Pressure Wave Reflection and Left Ventricular Diastolic Function

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Experimental data show that abrupt changes in load conditions during left ventricular (LV) ejection modify LV relaxation. In the presence of elevated aortic stiffness, pulse wave velocity (PWV) increases and the backward pressure waves originating at the periphery of the arterial tree by reflection of the primary arterial pressure waves may reach the left ventricle in systole and increase LV contraction or relaxation load. To assess whether early pressure wave reflection affects LV diastolic function, we investigated relations of PWV, intensity and timing of the reflected pressure waves with indices of LV relaxation and filling. We studied 20 healthy subjects (age 20–76 years)